DOCKET NO.: MSFT-0681(183208.1)
Application No.: 09/322,457
Office Action Dated: July 8, 2003

PATENT
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PROCEDURE PURSUANT TO
37 CFR § 1.116

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (previously presented) A method in a computer system for providing property notifications for properties of software components in a distributed computing environment, the method comprising:

registering, by a first software component, an interest in watching a property of a second software component;

receiving a notification when the property is set;

tracking a state of the second software component; and

determining when the second software component is in a down state based upon said tracking.

2.   (previously presented) The method of claim 1, further including retrieving the state of the property independently of receiving the notification.

3.   (previously presented) The method of claim 1, further including un-registering the interest in watching the property of the second software component.

4.   (previously presented) The method of claim 1, wherein the property has associated access rights and wherein an interest can only be registered by the first software component if the first software component has sufficient access rights.

5.   (previously presented) The method of claim 1, wherein a plurality of first software components have registered an interest in watching the property, and wherein each software component that is watching the property receives notification of a current setting of the property before any software component that is watching the property receives a notification of a subsequent setting of the property.

6.   (previously presented) The method of claim 1, wherein a plurality of first software components have registered an interest in watching the property, and wherein each software component that is watching the property receives notifications of a plurality of settings of the property in the same temporal order in which the plurality of settings occurred.

7.   (previously presented) A method in a computer system for providing property

notifications for property settings in a distributed computing environment, the method

comprising:

        for each of a plurality of software components, registering an interest in a property;

and

        setting the property a plurality of times;

        for each setting of the property, notifying each software component of the plurality of

software components that the property has been set prior to notifying any software

component of the plurality of software components of any later setting of the property.

8.   (previously presented) The method of claim 7, wherein each software component of

the plurality of software components receives the notifications of the settings in the same

temporal order in which the plurality of settings occurred.

9.   (previously presented) The method of claim 1, further including, after said registering,

determining when the second component enters an up state.

10.   (previously presented) The method of claim 9, wherein said registering takes place

prior to instantiation of the second component.

11.   (previously presented) A computer readable medium comprising computer executable

instructions for performing the method of claim 1.

12.   (previously presented) A computer readable medium comprising computer executable

instructions for performing the method of claim 8.

13.   (previously presented) A modulated data signal carrying computer executable

instructions for performing the method of claim 1.

14.   (previously presented) A modulated data signal carrying computer executable

instructions for performing the method of claim 8.

15.   (previously presented) A computing device comprising means for performing the

method of claim 1.

16.   (previously presented) A computing device comprising means for performing the method of claim 8.

17.   (Withdrawn) In a system for a distributed computing environment, wherein the system includes a communications bus, a bus manager having at least one bus management component, at least one server node and at least one client node, wherein said at least one server node, said at least one client node and said at least one bus management component are interconnected via said communications bus, and wherein each of said at least one client node includes a property watching component and at least one client resource that may request watching, aided by the property watching component, of at least one property of at least one server resource of said at least one server node, a method for communicating between a server resource and a client resource when the client resource is watching a property of the server resource, comprising:

      first registering by the client resource to track a property of a server resource;

      after the server resource enters the up state, second registering by the client resource to watch a property of the server resource; and

      after the property of the server resource is set, invoking by the server resource a property set function of the client resource.

18.   (Withdrawn) A method according to claim 17, wherein said first registering includes determining that the property of the server resource is available.

19.   (Withdrawn) A method according to claim 17, further including receiving by the client resource an initial value of the property after the server resource enters the up state.

20.   (Withdrawn) A method according to claim 19, wherein the client resource does not receive any subsequent setting of the property until the initial value of the property is received.

21.   (Withdrawn) A method according to claim 17, wherein a server node of the at least one server node is also a client node of the at least one client node.

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22.   (Withdrawn) A method according to claim 17, wherein the communications bus includes a medium having shared memory.

23.   (Withdrawn) A method according to claim 17, wherein said invoking includes passing the context received from the client resource and passing the value of the property.

24.   (Withdrawn) A method according to claim 23, wherein the property set function of the client resource uses the context to identify the property and perform the behavior specified when the client resource specified its interests in watching the property.

25.   (Withdrawn) A method according to claim 17, further including invoking on behalf of the client resource the stop watching property function of the server resource.

26.   (Withdrawn) A method according to claim 17, wherein said second registering includes invoking a watch property function of the server resource passing at least one of (1) the identification of the property to be watched, (2) an identification of the client resource and (3) a context of the client resource that uniquely identifies that property to the client resource.

27.   (Withdrawn) A method according to claim 17, further including:

third registering by the server resource to monitor each client resource that at least one of first registers and second registers, so that when a client resource goes down, the method further includes:

receiving by the server resource a resource is down notification on behalf of a client resource; and

upon receiving such a notification, the server resource stops notifying the client resource when the property is set.

28.   (Withdrawn) A method according to claim 17, wherein a client node having a client resource caches at least one property value from the server resource.

29.   (Withdrawn) A method according to claim 17, wherein the property watching component of a client resource utilizes at least one of a directory object data structure, a resource reference object data structure and a client object data structure.

30.   (Withdrawn) A method according to claim 29, wherein when a property of a server resource is being watched, a special type of client object is added to the list of client objects of the resource reference object data structure for the watched server resource.

31.   (Withdrawn) A method according to claim 30, wherein the special type of client object indicates that it represents the watching of a certain property and includes a property reference object for each time that the client resource has registered to watch that property.

32.   (Withdrawn) A method according to claim 31, wherein each property reference object has a function that is invoked when the property is set to notify the client resource.

33.   (Withdrawn) A method according to claim 17, wherein the at least one server node includes a context/client table that includes an entry for each property of a server resource that is being watched by at least one client resource, wherein each entry includes a context and a property client indicator and wherein the context uniquely identifies the server resource and property from the perspective of the client resource and the property client indicator refers to the corresponding property client object.

34.   (Withdrawn) A method according to claim 17, wherein the client resource further includes a synchronize property function, wherein the synchronize property function is invoked by the server resource when a client resource first registers to watch a certain property of that server resource to provide the current value of the property to the client resource.

35.   (Withdrawn) A computer readable medium comprising computer executable instructions for performing the method of claim 17.

36.   (Withdrawn) A modulated data signal carrying computer executable instructions for performing the method of claim 17.

37.   (Withdrawn) A computing device comprising means for performing the method of claim 17.

38.   (Withdrawn) In a system for a distributed computing environment, wherein the system includes a communications bus, a bus manager having at least one bus management component, at least one server node and at least one client node, wherein said at least one server node, said at least one client node and said at least one bus management component are interconnected via said communications bus, and wherein each of said at least one client node includes at least one client resource for requesting watching of at least one property of at least one server resource of said at least one server node, a method for watching the at least one property of the server resource by the client resource aided by a property watching component, including:

        first registering by at least one client resource to receive a notification when a property of a server resource is set;

        receiving by the client resource said notification; and

        in response to receiving said notification, performing a behavior on behalf of the client resource.

39.   (Withdrawn) A method according to claim 38, wherein the property is set when at least one of (1) the server resource performs a function that replaces data upon which the value of the property depends, (2) when another process in the system replaces data upon which the value of the property depends, (3) when the value of the property is replaced in response to the invocation of a set property software component, (4) the server resource performs a function that signals an event upon which the value of the property depends, (5) when another process in the system signals an event upon which the value of the property depends and (6) when an event upon which the property depends is set in response to the invocation of a set property software component.

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40.   (Withdrawn) A method according to claim 38, wherein said first registering includes:

invoking a registering software component which includes passing to the registering software component at least one of (1) an identification of the property, (2) a reference to the client resource requesting to watch the property and (3) a context used to identify the watching relationship within the client resource.

41.   (Withdrawn) A method according to claim 40, wherein the identification of the property includes at least one of a server resource identification and a property identification within the server resource.

42.   (Withdrawn) A method according to claim 40, further including:

receiving the invocation to the registering software component by the server node; and

adding an entry into a property/client table within the server resource for the client resource.

43.   (Withdrawn) A method according to claim 42, further including:

removing the entry from the property/client table upon receiving information on behalf of the client resource that the interest of the client resource in the property of the server resource ceased.

44.   (Withdrawn) A method according to claim 42, further including:

determining whether the entry is already in the table; and

if the entry is not already in the table, passing an indication of the client resource and receiving in return a handle for identifying that registration.

45.   (Withdrawn) A method according to claim 42, further including:

retrieving the property value for that property; and

invoking a synchronize property function of the property watching component on behalf of the client resources being passed the context and the retrieved property value such that all of the client resources registered to watch the property are notified of the setting of

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the property before any of the client resources are notified of a subsequent setting of the property.

46.   (Withdrawn) A method according to claim 38, wherein a server node of the at least one server node is also a client node of the at least one client node.

47.   (Withdrawn) A computer readable medium comprising computer executable instructions for performing the method of claim 38.

48.   (Withdrawn) A modulated data signal carrying computer executable instructions for performing the method of claim 38.

49.   (Withdrawn) A computing device comprising means for performing the method of claim 38.

50.   (Withdrawn) A server resource of a server node in a system for a distributed computing environment, wherein the system further includes a communications bus, a bus manager having at least one bus management component and at least one client node, wherein said server node, said at least one client node and said at least one bus management component are interconnected via said communications bus, and wherein each of said at least one client node includes at least one client resource for requesting watching of at least one property of the server resource of the server node, the server resource comprising:

       a property/client table that includes an entry for each property of the server resource that is being watched by at least one client resource of the at least one client node;

       a watch property function mechanism for receiving requests from the at least one client resource to watch at least one property of the server resource; and

       a stop watching property function mechanism for terminating the watching of the at least one property of the server resource by the at least one client resource.

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51.   (Withdrawn) A server resource according to claim 50, wherein the watch property function mechanism is passed at least one of an indication of the property of the server resource, the identification of the client resource and a context.

52.   (Withdrawn) A server resource according to claim 50, wherein the watch property function mechanism adds a client watching property object to the property/client table to indicate that the client resource is watching the property.

53.   (Withdrawn) A server resource according to claim 50, wherein the watch property function mechanism requests that the client resource be monitored using a monitoring mechanism of the system.

54.   (Withdrawn) A server resource according to claim 50, wherein each entry of the property/client table includes an identification of the property, one of a reference to a value for the property and a value for the property and a client monitoring object for each client resource that has registered to watch that property.

55.   (Withdrawn) A server resource according to claim 54, wherein each entry further includes one of a reference to a queue for storing property values and a queue for storing property values in the order in which they are set pending notification of each of the client resources of previous settings of property values.

56.   (Withdrawn) A method according to claim 50, wherein a server node of the at least one server node is also a client node of the at least one client node.

57.   (Withdrawn) In a system for a distributed computing environment, wherein the system includes a communications bus, a bus manager having at least one bus management component, at least one server node and at least one client node, wherein said at least one server node, said at least one client node and said at least one bus management component are interconnected via said communications bus, and wherein each of said at least one client node includes at least one client resource for requesting watching of at least one property of

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at least one server resource of said at least one server node, a method for registering to watch a property of the server resource by the client resource, comprising:

invoking a register watch function of a client resource, wherein the register watch function is passed an identification of the server resource to be watched, an identification of a property of the server resource to be watched, and an identification of the client resource that will be watching the server resource;

determining whether the client resource is already watching the property; and

if the client resource is not already watching the property according to said determining, generating a unique context for the client resource and the property.

58.   (Withdrawn) A method according to claim 57, wherein said generating includes:

invoking a watch property function of the server resource, passing the identification of the property and the context to the server resource;

generating a property client object for that property and adding the property client object to a client object list of a resource reference object for the server resource; and

adding an entry to a context/property table utilized for the server resource.

59.   (Withdrawn) A method according to claim 58, further including:

if the client resource is already watching the property according to said determining, adding the property reference object to the list associated with the property client object.

60.   (Withdrawn) A method according to claim 57, wherein a server node of the at least one server node is also a client node of the at least one client node.

61.   (Withdrawn) A computer readable medium comprising computer executable instructions for performing the method of claim 57.

62.   (Withdrawn) A modulated data signal carrying computer executable instructions for performing the method of claim 57.

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63.   (Withdrawn) A computing device comprising means for performing the method of claim 57.

64.   (Withdrawn) In a system for a distributed computing environment, wherein the system includes a communications bus, a bus manager having at least one bus management component, at least one server node and at least one client node, wherein said at least one server node, said at least one client node and said at least one bus management component are interconnected via said communications bus, and wherein each of said at least one client node includes at least one client resource has registered an interest in at least one property of at least one server resource of said at least one server node, a method for setting a property of the server resource by the client resource, comprising:

        invoking a property set function by a client resource registered with an interest in a server resource including:

        passing the set property function a context and a property value;

        retrieving a reference to a property client object having at least one property reference object from a context/client table using the passed context; and

        invoking the behavior associated with each property reference object for the property client object.

65.   (Withdrawn) A method according to claim 64, wherein said invoking includes:

        selecting a property reference object of the property client object; and

        invoking the value set function of the property reference object to notify the client resource that the property has been set.

66.   (Withdrawn) A method according to claim 65, wherein said selecting and invoking begins with the first property reference object and performs said selecting and invoking until all of the property reference objects have been selected.

67.   (Withdrawn) A method according to claim 64, wherein a server node of the at least one server node is also a client node of the at least one client node.

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68.　　(Withdrawn) A computer readable medium comprising computer executable instructions for performing the method of claim 64.

69.　　(Withdrawn) A modulated data signal carrying computer executable instructions for performing the method of claim 64.

70.　　(Withdrawn) A computing device comprising means for performing the method of claim 64.